

PCBs, Our Schools, and Children

**NO TOXICS IN
OUR SCHOOLS!**

PCBs

SIGN THE PETITION

POLYCHLORINATED
BIPHENYLS
(PCBs)



What are PCBs (polychlorinated biphenyls)?

PCBs were widely used after World War II and prior to 1979 in building construction. However, they were banned for most uses by federal law because they are widely considered to be highly toxic. Their adverse health effects in people include affecting the reproductive, immune, endocrine and nervous systems, and causing cancer in animals.

These toxins are likely to exist in a large number of New York City School buildings that were constructed before the late '70s when PCBs were routinely used in buildings. The question that is being asked now is how many schools are affected and how should the city deal with this huge public health problem?

Issue with PCBs in New York City Schools

PCBs were an element in school construction and electrical products from as early as the 1950s and until 1978, indicating that countless students over three decades could have been exposed over the long-term to this dangerous chemical. Meanwhile, PCBs have not been removed from schools such as P.S. 178 in the Bronx, which tested with levels 2,000 times the legal limit. (The legal PCB limit is 50 parts per million, ppm.) And, while the Department of Education said that air sample levels improved after PCB-tainted caulking and light fixtures were removed from other locations, levels remain higher than federal guidelines.

Although it would be very costly to decontaminate New York City's schools, adverse health effects including cancer and other life-threatening diseases and disorders have been linked to PCB exposure. Worse, because decontamination efforts have not been considered, students continue to be exposed—some at very high levels—to this banned toxin. The potential long term health effects could be substantial.

What Happens To PCBs When They Enter The Body?

PCBs can enter human cells and tissues when contaminated air is breathed in, when contaminated food enters the digestive system, or through contact with the skin. Tests on laboratory animals show that PCBs are readily absorbed through the digestive tract when swallowed, and to a lesser extent through the skin.

Once in the gastrointestinal tract, ingested PCBs diffuse across cell membranes and enter blood vessels and the lymphatic system. PCBs, especially those that contain a greater number of chlorine atoms, are readily soluble in fats and thus tend to accumulate in fat-rich tissues such as the liver, brain and skin.

PCBs can undergo different transformations in the body and then either be stored in certain tissues or excreted.

How Do PCBs Affect Health?

Acne-like skin rashes are a side effect of PCB exposure in adults and for children the side effects are much worse, seriously affecting neurobehavioral and immunological changes. PCBs are known to cause cancer in animals.

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Liver damage may occur in exposed workers and can be found when testing blood and urine levels. PCB exposure in the general population is not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach and thyroid gland injuries. Other effects of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens (substances that cause cancer). The Environmental Protection Agency (EPA) and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

Why Is It More Harmful To Our Children?

It has been known for some years that children are more susceptible to damage from PCBs and other toxins than adults are. Some of the reasons:

- ❖ Children absorb chemicals better than adults through their skin, their gastrointestinal tract, and their lungs;
- ❖ Children--especially prior to, or shortly after birth--have poorly-developed systems for detoxifying chemicals;
- ❖ Children take in more calories per pound of body weight compared to adults;
- ❖ Children have more skin contact with the outside and household environments, compared to adults and exhibit hand-to-mouth exploratory behavior.

PCBs Levels In New York City Schools

Three New York City schools that have been tested for PCBs have higher than acceptable levels of the dangerous toxins. The schools—P.S. 199, located on Manhattan's Upper West Side; P.S. 178, which is on Bronx's Baychester Avenue; and P.S. 309, in Bedford-Stuyvesant, Brooklyn—all tested with PCB levels in excess of those deemed acceptable according to federal guidelines.

Below are the results of schools in New York City, particularly Manhattan, where elevated levels of PCBs have been found.

Manhattan Area

PS 37 (District 4) - Elevated levels found in at least one classroom. Level was at 3200 parts per million.

PS 112 (District 4) - Elevated levels found in at least two classrooms. Levels were 130 parts per million and 200 parts per million.

PS 199 (District 3) - Tested over 6 months ago. Results showed elevated levels of PCBs (not sure of current amounts).

PS 206 (District 4) - Elevated levels found in at least five classrooms. Levels ranged between 95 parts per million and 7600 parts per million.

- ❖ The legal PCB limit is 50 parts per million (ppm).

List of Potential and Confirmed Contamination Schools In District 3

NYC Schools:

Potential and Confirmed PCB contamination in Caulk and Light Fixtures
by NEWYORK LAWYERS FOR THE PUBLIC INTEREST

School Name	Caulk	Lighting	Status of Light Replacement	Number of PCB Fixtures	Status of Caulk Remediation
P.S. 9	Potentially Contaminated	No PCB Lights	N/A	N/A	Untested and Unremediated
P.S. 75	Contaminated	PCB Lights	Within the next 10 years	527	Unremediated
P.S. 76	Contaminated	PCB Lights	Within the next 10 years	511	Unremediated
P.S. 84	Potentially Contaminated	PCB Lights	Within the next 10 years	554	Untested and Unremediated
P.S. 87	Potentially Contaminated	PCB Lights	Within the next 10 years	472	Untested and Unremediated
P.S. 145	Contaminated	PCB Lights	Within the next 10 years	520	Unremediated
P.S. 163	Potentially Contaminated	PCB Lights	In Progress	433	Untested and Unremediated
P.S. 180	Potentially Contaminated	PCB Lights	Within the next 10 years	668	Untested and Unremediated
P.S. 185	Contaminated	PCB Lights	Within the next 10 years	695	Unremediated
P.S. 191	Potentially Contaminated	PCB Lights	Within the next 10 years	76	Untested and Unremediated
P.S. 199	Contaminated	No PCB Lights	Completed	N/A	Remediated
P.S. 241	Contaminated	No PCB Lights	N/A	N/A	Unremediated
P.S. 452	Potentially Contaminated	PCB Lights	Within the next 10 years		Untested and Unremediated

❖ Fixture : the entire structure of the lighting unit.

Several Studies On Babies and Children Exposed To PCBs

- PCBs Linked To Low IQ In Children

A study confirms that children exposed to low levels of PCBs in the womb grow up with low IQs, poor reading comprehension, difficulty paying attention, and memory problems.

This latest study, published in the *NEW ENGLAND JOURNAL OF MEDICINE*, describes a group of children --now 11 years old --whose mothers ate PCB-contaminated fish from Lake Michigan more than once a week for several years before giving birth. The children's mental, physical, and emotional growth has been followed since birth. The mental deficits are most obvious in the 11% of the children with the most PCBs in their blood.

Starting 15 years ago, Joseph and Sandra Jacobson, husband-and-wife psychologists at Wayne State University in Detroit, Michigan, looked at babies born to women who had eaten trout and salmon from Lake Michigan. Fish from polluted lakes, rivers, and coastal waters are a well-established source of PCBs and other contaminants. The Jacobsons asked several thousand new mothers about their fish-eating habits and studied the children of more than 200 of them.

The Jacobsons analyzed the PCB levels found in the blood of each baby's umbilical cord, as an indicator of PCB exposure before birth. At birth they found children who had higher exposures to PCBs had smaller heads and lower weights. At seven months, they tested the babies for mental function by showing them two identical photos for about 20 seconds. One of the photos was then paired with a new photo and shown to the baby again. The normal response for an infant is to spend more time looking at the new picture, indicating that it recognizes the familiar one. The babies who had the highest exposure to PCBs, however, spent as much time looking at the old photo as the new one, suggesting either deficits in short-term memory or attention problems.

When the children were four years old, they were given a battery of mental tests. Again the highly exposed children showed memory impairments, this time in tests that asked them to recall progressively longer strings of words and numbers. The differences in scores between unexposed and the highest-exposed children, says Joseph Jacobson, "would be like ten points on an IQ test. We're not seeing mental retardation, but we are seeing that the children are just not doing as well.

- Early-Life Exposure To PCBs Linked To Lower Vaccination Response

Early-life exposure to polychlorinated biphenyls (PCBs) was associated with reduced diphtheria and tetanus antibodies after vaccination, according to a study published in *Environmental Health Perspectives*.

"PCBs may cause immunotoxic effects, but the detailed dose-response relationship and possible vulnerable time windows of exposure are uncertain," writes Carsten Heilmann, from Copenhagen University Hospital, Rigshospitalet, in Denmark and colleagues. "This study applied serum concentrations of specific antibodies against childhood vaccines as sentinels of immunotoxicity. The main objective was to assess the possible dependence of antibody concentrations against diphtheria and tetanus toxoids in children in regard to prenatal and postnatal PCB exposures."

The study cohort consisted of 656 singleton births from 1999 to 2001 in the Faroe Islands, where differing consumption patterns of contaminated traditional foods such as pilot whale blubber result in widely varying PCB exposure.

At ages 5 and 7 years (before and after a booster vaccination), children were invited for evaluation including determination of serum antibody concentrations and total PCB concentrations in serum. Data was also available on PCB concentrations in maternal pregnancy serum and maternal milk, and a subgroup also had data on PCB serum levels in the children at age 18 months.

At ages 5 and/or 7 years, 587 children were evaluated. Before the booster vaccination at age 5 years, the antidiphtheria antibody concentration was inversely associated with PCB concentrations in milk and 18-month serum. At age 7 years, after booster vaccination, concentrations of antibodies against both toxoids were inversely associated with PCB concentrations at age 18 months. For each doubling in PCB exposure, antibody concentration decreased up to 20%. At age 5 years, a doubling in PCB in milk and 18-month serum was associated with a 30% increase in odds of having antidiphtheria antibody concentrations below a clinically protective level of 0.1 IU/L.

"Developmental PCB exposure is associated with immunotoxic effects on serum concentrations of specific antibodies against diphtheria and tetanus vaccinations," the study authors write. "The immune system development during the first years of life appears to be particularly vulnerable to this exposure."

Limitations of this study include incomplete serum collection at age 18 months.

"The clinical importance of our findings is therefore that the PCB exposure may increase the risk of a child not being protected against diphtheria and, possibly, tetanus, despite a full schedule of vaccinations," the study authors write. "Because of the involvement of several key components of the immune system, antibody concentrations triggered by standardized antigen stimulations may reflect the overall efficacy of the immune system in relation to infection. The PCB-associated decreases in antibody concentrations may therefore also relate to potential adverse consequences of immune system deficits beyond the protection against the two specific bacteria."

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New York Lawyers For The Public Interest, Inc.

PILOT STUDY TEST RESULTS by School Construction Authority

Questions Parents May Have

- ✓ How much are our children affected by PCBs in school?
 - ✓ What can be done to reduce PCB exposure in schools?
 - ✓ Do PCBs represent a health risk for our children and are there long term effects?
 - ✓ Are there teachers who have experienced long term exposure to PCBs who have serious health problems?
 - ✓ How can I limit PCB exposure to my children?
 - ✓ What government efforts are underway to remove PCBs from public schools?
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